state of vinous fluid, weak spirit, strong spirit, or even of alcohol, or ether, is subject to precisely the same decomposition, under favourable circumstances for such changes, without any action upon, or relation to the water which may happen to be combined with it in each kind of liquor. This olefiant gas cannot, either by distillation or other means, be separated along with any of the water with which it is at first combined, and again united with the same materials, without forming a compound different from the original one: and in proportion as water is, by any means, removed, we obtain it in a somewhat different state; and this happens without reference to a separate and distinct substance which we may call alcohol, or ether. Thus neither of these two ill-defined substances ought to be regarded as a separate and distinct principle; but the whole series of bodies, from the weakest fermented liquor, separated from its vegetable matter, to the most highly rectified ether, consist only of different combinations of olefiant gas, the first product of vinous fermentation, and water.

11. "On the Chemical Changes occurring in Seeds during Germination." By the same.

The author infers, from his researches on the subject of his second paper, that during the process of germination there is a production of alcohol, and that oxygen unites with olefiant gas, under the influence of the radicle and plumula. He accounts for the increase of temperature during germination by an alleged difference in the specific heats of the principles before and after that process has commenced; but the methods he employed for establishing the reality of this difference are not detailed.

The following are the principal conclusions to which the author arrives:

1. Seeds may, by careful desiccation, be deprived of much water without injuring their vegetating organs.

2. Their capacity for absorbing water varies with the temperature at which they are kept.

3. The increase taking place in their volume by the absorption of water is influenced by temperature.

4. On steeping seeds in water at one temperature the vinous fermentation takes place, but at another this process does not occur.

5. A decomposition takes place in seeds previously to their germination, and the products are carbonic acid and olefiant gas.

6. The abstraction of carbon from seeds by the oxygen of the atmosphere is not, as is generally supposed, the specific action which gives rise to germination; but it rather conduces to putrefaction.

7. The germination of seeds appears to be an action taking place between the olefiant gas, which has been previously formed by a vinous fermentation, and the oxygen of the atmosphere; and is effected by the peculiar operation of the plumula and the rootlets.

8. This decomposition and combination of the different elements go on, in well-regulated processes, as long as there is any farinaceous matter to be decomposed: the food of the plant being at this time always the oxygen of the atmosphere, and the newly-formed olefiant

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gas, differing in equivalent combinations, according to the peculiar constitution of the plant; and thus the foundation is laid for all that prodigious diversity which characterizes the numberless species of the vegetable creation.

12. "A Comparison of the late Imperial Standard Troy Pound Weight with a Platina copy of the same, and with other Standards of authority." Communicated by Professor Schumacher, in a Letter to Francis Baily, Esq., V.P. and Treas. of the Society.

Professor Schumacher being desirous of procuring an accurate copy of the English Imperial Standard Troy pound weight, for the purpose of comparison with the Danish weights, applied to Capt. Kater, requesting him to cause such copy to be made; which was accordingly done. It was made of brass by Bate; but the result of the weighings not being satisfactory to Professor Schumacher, he desired to have a second copy forwarded to him. As these two copies did not agree in their results, the first was returned to Capt. Kater with a request that he would repeat the weighings. The result confirmed Professor Schumacher's suspicions: and as it was not thought proper that, in an affair of so much importance as the comparison of the standard weights of two nations, any source of discordance should exist, or even be suspected, (the preceding experiments having been made with a *copy* of the Imperial standard weight) the Danish Government sent over Capt. Nehus (of the Royal Danish Engineers) to this country for the express purpose of making comparisons with the *original* standard, in the possession of the Clerk of the House of Commons.

The weighings took place in the Apartments of this Society, and were partly made with Ramsden's balance, belonging to the Society. Besides the first brass weight above mentioned, there was another brass weight made by Robinson, a platina weight made by Cary, the brass pound weight belonging to the Royal Mint, and the platina pound weight belonging to this Society. These were all subjected to a most rigid and accurate series of weighings by Capt. Nehus, in which every precaution was taken to insure the most correct results. It would be impossible here to follow Capt. Nehus through all his details: but it may be sufficient now to state that upwards of 600 comparisons were made with the English Imperial standard, all of which are apparently very accordant; but, on account of a singular circumstance connected with the *original* standard, do not possess that degree of precision, nor afford that satisfaction which ought to attach to an affair of so much importance. For, it appears that not only the specific gravity of the original standard had never been ascertained, but that we are even ignorant of the kind of metal of which it was composed: some persons maintaining that it was of brass, others of copper, and others of bell-metal. And, as the original was totally destroyed in the late fire which consumed the two Houses of Parliament, we cannot now supply this omission. It is well known that the specific gravity of brass may vary from 7·5 to 8·5; so that a difference of at least $\frac{1}{2}$ of